



QUINTESSENCE OF THE CONVENTIONAL MEDICINES OF AN ENDEMIC TRIBE OF WEST BENGAL, INDIA

Promit Kumar Ghosal^{1*}, Arunasis Goswami² and K.C. Dhara³

¹Department of Agriculture and Rural Development, West Bengal State University, Berunanpukuria, Malikpur, Barasat, 24 Parganas (N), Kolkata (West Bengal), India.

²Department, of Veterinary & Animal Husbandry Extension Education, West Bengal University of Animal and Fisheries Sciences, Kolkata (West Bengal), India.

³Directorate of Research Extension and Farms, West Bengal University of Animal and Fisheries Sciences, Kolkata (West Bengal), India.

Abstract

Toto is the one and the only endemic endogamous tribe of the state of West Bengal, residing in a small settlement called Totopara at Madarihat Subdivision of the present Alipurduar District of the state. They have their age old traditional medicinal practices which are entirely based on natural resources. The Toto medicine and their medicinal practice is a vast science and this science has no written documentation. There are hardly 2 to 3 people in the entire Toto community who practice this system of medicine and recognized as the Medicine man or “*Pao*”. These people maintain this medicinal knowledge completely based on their regular practice and it carried from one generation to the next based on the ancestral inheritance system. However, due to fast pace of westernization and acculturation of the Toto community this age old knowledge is at the verge of extinction. In this context, the present study was made with objective to explore the age old practice of ethno medicinal practices among this community. The present study reveals that Toto tribe is ethno-botanically very sound. In this present study we are able to collect 91 ethno botanical information treating 39 different ailments. It is very interesting to note that this list of ailments comprises very simple as well as very complex diseases like gastric disorder to a complex diseases like ophthalmic problem and cardiac diseases.

Key Words: Toto Tribe, Traditional Medicine, West Bengal.

Introduction

“Toto” one and the only endemic tribal group of the state of West Bengal resided at the Totopara of the Madarihat Subdivision of the Alipurduar District of the state. This endogamous tribal group in the verge of extinction, their population is lowering down to less than 1000 in the year 1999 but after then with comprehensive development program initiated by the Government of West Bengal their population is now increased to 1500 (Census report 2011). This is the only tribal group which consumed beef and pork at a time. This endogamous tribal group is again divided into 8 – clans and marriage among these 8 – clans of Toto tribe is permissible (Sanyal, 1973). Others social aspects of this unique tribal community had been studied by different workers like (Mitra, 1951, Majumdar, 1995, 1998, 2010, Toto, 2012

etc.). These Toto people practice traditional medicine to cure their ailments. The medicinal plant wealth of the Jalpaiguri district has been studied by (Nandi, 2013, Chatterjee, 2013, Majumdar, 2013, Halder, 2013 etc.), but in these work nothing is mentioned about the Toto Medicine. Mudgal *et al.*, (1999), first document the Ethnobotanical lore of the Toto Tribe but, that work is not complete in every respect. There are still some stone remain unturned regarding the traditional medicinal lore of the Toto tribe, which we try here to do. These people are entirely dependent on the nature to meet up their day to day needs. With the increasing human civilization and rapid spread of industrialization natural abode of this tribal group is on the verge of destruction. Besides these this tribal group has no written documentation, they pass their knowledge wealth in ancestral manner from father to son so, with the extinct of this group specially those 2-3

**Author for correspondence* : E-mail : promitghosal@gmail.com

people who practice this system of traditional medicine, these vast knowledge of this group related to nature also will be vanished. So, to record this vast wealth of knowledge before they lost entirely ethnobotanical exploration is the only way to achieve this goal.

Area of Study

“Totopara” situated in between 26° 49' 48.00"N latitude & 89° 18' 36.00"E longitude covering an area of 8.0814sq km. in the Madarihat subdivision of the present Alipurduar District (erstwhile Jalpaiguri district) of the state of West Bengal. This area is bounded by the foothills of Bhutan to the north, *Torsha* river to the east, *Titi* river and *Titi* reserve forest on the south-west by the *Hauri* river (Map of Totopara).

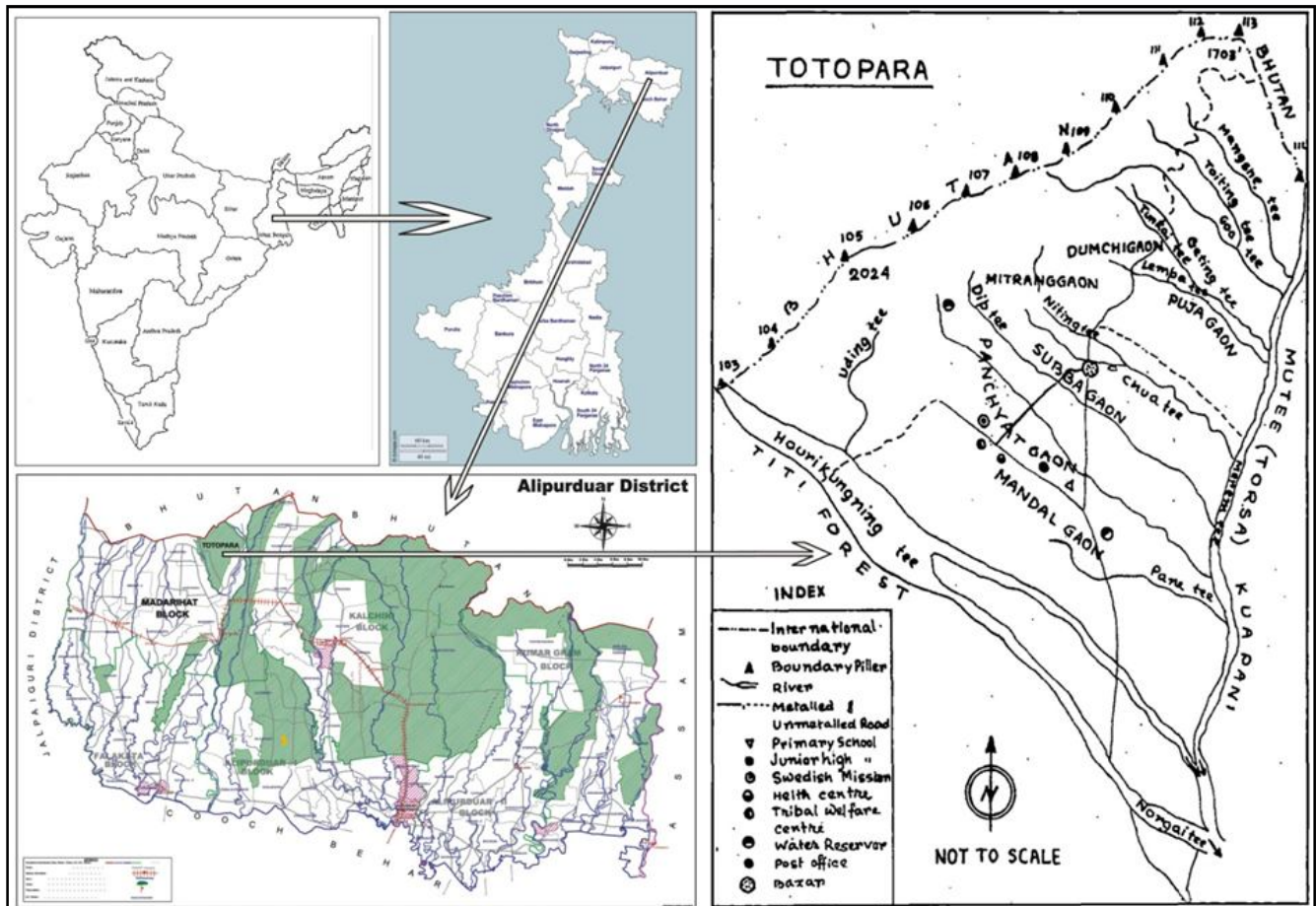
The average annual rainfall is 3,900 mm. The summer is rather hot and the mean maximum temperature varies between 33-35°C and the mean minimum temperature in winter varies between 7.5-10°C. This damp warm climatic condition of the region helps to form a diverse growth of luxuriant vegetation in the tract. Generally the vegetation pattern is mixed deciduous forest types. This is predominantly covered by the dense forests of Sal, mixed with other deciduous and the ever green trees.

Composition of the patches of evergreen forests is riverine Khair-Sisso forests, the Savannah vegetation and dense jungles of shrubs, creepers, herbs are also available. This tract of land is designated as the “anthropological Museum of the state” due to its wide range of diversity of different tribal communities, which comprises of Rabha, Rajbanghsi, Santal, Munda, Oraon, Polia/Polly, Lepcha, including one and the only endemic tribes the TOTO, etc.

Materials and Methods

This present work is the outcome of extensive field work for the last 7 years in different pockets of Totopara. All the information collected from the Toto Medicine men and women of different Toto clan by personal interview. Questioners are prepared based on the standard literature as mentioned by Jain & Mudgal (1999). In each case voucher specimens were collected and they are treated with standard technique as mentioned by Jain & Rao (1977). For future reference during collection of information local Toto name of every plant along with the common English name where it is obtained is collected.

In the enumeration list all information is arrange in



Map – Map of Totopara [Totopara layout Source: Majumdar 1993].

Table 1: List of Traditional Medicine prepared from aromatic and medicinal plants collected from Totopara of Alipurduar districts of West Bengal during field survey.

Sl. No.	Family Name	Botanical Name	Vernacular Name	Habit & Habitat	Parts Use	Use & Formulation
1	Acant-haceae	Adhatoda vasica Nees.	Basak (To) Basak (B) Malabarnut(E)	Terrestrial/ Shrub	Leaf	1. Fever: Fresh leaves 8-10 are clean properly and then put in a brass pot with its approximate four times water, the whole mixture is boiled till it comes half of its original volume. The aqueous obtained is given @2Tsp for 2-3times a day for 3 days to reduce the body temperature due to fever. extract thus 1. Skin disease (Rash): Handful of fresh leaves are put in a pot full of boiled water for about 2 – 3 hours and then after cooled the soaked leaves are squeezed gently to a soft paste, the paste thus obtained is applied externally as poultice with cotton role on the effected part to reduce the itching and rash on the skins. In case of acuteness of the disease the remaining aqueous extract of the leaves is kept in a hollow bamboo jar and later used during bath. 2. Jaundice: Fresh Leaves are squeezed in a mortar and juice thus obtained is given @2Tsp full twice daily one at early morning in empty stomach and the second before dinner till complete recovery. 3. Fever with Cold: A handful of fresh leaves are boiled with one cup of water and the lukewarm decoction is used as nasal drops to relief of congestion in the nose and or running the lukewarm About 2 – 5 gms. of rhizome of Bon-ada (Kaempferia rotunda) are finely chopped into slices and these slices are boiled with the above aqueous decoction of the leaves the whole mixture thus obtained is taken like Chai (Tea) to reduce feverish sensation.
3		Hygrophila schulli (Buch. Ham.) M. R. et S. M. Almeida	Kulekhara (B) Marsh barbel (E)	Aqua /Herb	Leaf	Bleeding: i) Fresh Leaves about 20gms are cleaned and crushed with water on grinding stone; the aqueous decoction thus obtained is taken @1Tsp at early morning in empty stomach thrice in a week to stop bleeding from internal organ. ii) Same crushed leaves are also applied directly on the cut or wound to stop bleeding. N.B.: This herb is only seasonally available near aquatic sites on bank of Hauri & Titi rivers.
4		Phlogacanthus thyriflorus (Roxb.) Nees.	Kising (To) Ram-Basak (B) Nongm-angkha(E)	Terrestrial/ Shrub	Leaf, Root & Flower.	1. Abdominal pain: 10-12 flowers or flower buds are clean properly and boiled in a cup of water. 2Tsp of the aqueous extract thus obtained is given 2-3times a day (must be the first dose at early morning in empty stomach) to reduce the pain. 2. Cough & Cold: Leaf & Root in 1:1 ratio are clean properly and crushed & squeezed with a few drops of honey, the juice thus obtain is given 2-3times daily till complete recovery. 3. Leaves are also use as fodder to cattle.
5	Alangiaceae	Alangium salviifolium (L.f.) Wangerin	Ankora(To) Akarakanta (B) Sage-leaved alangium(E)	Terrestrial/ Tree	Root	Dyspepsia: Root or root part collected from the nearest jungle and sun dried and crushed on black grinding stone, the powder thus obtain is taken with a glass of lukewarm water at early morning in empty stomach to cure indigestion.
6		Achyranthes	Kerangba(To) Apang (B)	Terrestrial	Leaf &	1. Gynecological problems including abortion: Root extract is given to married women to treat their gynecological problems. In case of abortification the root or root part is use. (Totos are not

Table 1 Continued.....

Table 1 Continued.....

	aspera L.	prickly chaff flower (E)	/Herb	Root	liketo discussed much about their process of abortifacient treatments openly) 2. Sores & wounds: Fresh leaves are crushed and squeezed and thus the extract 2-3 drops are directly put upon the sore or wound areas. The treatment continues till the wound heal up totally. 3. Constipation: Leaves and roots boiled together in 2:1 ratio and made in to mesh and mixture thus obtained are given @1/2 cup at bedtime as a laxative. 4. Abscess: Leaves and roots 1:1ratio are crushed with stone mortar pestle and the paste thus obtained is applied as poultice on abscesses before bedtime for early suppuration. 5. Leaves are used as vegetable and as fodder to cattle.
7.	Amaranthaceae	Parucha(To) Kantanote (B) spiny pig weed(E)	Terrestrial/ Herb	Leaf & Root	
8	Amaranthaceae	Ahmicha(To) Notesak(B) Green Amaranth(E)	Terrestrial/ Herb	Leaf	1. Antidote: Scorpion/Centipede stings: Leaves are cleaned and squeezed between the palms and juice thus obtained is applied immediately on biting area to get relief from pain and the burning sensation in case of Scorpion and Centipede stings. 2. Whole plant used as vegetable seasonally.
9	Anacardiaceae	Taitenamsaiti(To) Aam(B) Mango(E)	Terrestrial/ Tree	Leaf	Eye sty: Tender leaves 2 -5 pieces are crushed and squeezed and juice thus obtained is filtered. The filtrate is used as eye drops and applied on the edge of the eye lids to reduce the inflammation and redness of the cornea as well as irritation of the eye due to infection.
10	Annonaceae	Langaya(To) Barachali(B) Corky Debber Tree (E)	Terrestrial/ Tree	Bark	Antidote to Scorpion & Centipede sting: Dry barks are crushed with a stone with a little amount of Eu (locally available homemade country liquor) and the paste thus obtained is applied immediately on biting area to give relief from pain and the burning sensation in case of Scorpion and Centipede stings.
11	Apiaceae	Ticha (To) Thankuni (B) Indian Pennywort (E)	Terrestrial/ Herb	Whole Plant	1. Indigestion: A hand full of fresh leaves are cleaned and squeezed, the extract thus obtained is used as treatment of Liver complaints. For better results, seeds of Timbur (<i>Zanthoxylum armatum</i>) soaked into drinking water at about 1:4 ratio for overnight, then filtered and the filtrate are mixed with previous juice and mixture thus obtained is used as medicine preferably at early morning in empty stomach. 2. Whole or part of plant is used as vegetable also.
12	Apocynaceae	Koren-gdabai(To) Sarpogandha (B) Indian Snakeroot (E)	Terrestrial/ Under Shrub	Root	1. Uterine contraction: Roots or part of roots are cleaned and crushed on a red stone mortar then mixed few drops of water from a secrete water-falls (above Bhutan hills); aqueous mixture thus obtained is given to increase uterine contraction during labour. 2. Blood pressure: Roots or part of roots are cleaned and crushed on a black stone mortar; then the paste of the root is boiled with drinking water in a wide mouthed earthen pot till the final solution reduced to 1/3rd of its primary content; the aqueous extract thus obtained is given to control high blood pressure.
13	Araliaceae	Harsoo (To) Money Plant (B) Climbing	Terrestrial/ Climber	Leaf & Stem	1. Small Pox/Measles: A hand full of leaves are sun dried and the dried materials chopped into small pieces and powdered with stone and powdered leaves are applied with Eu (locally available homemade country liquor) to reduce the pockmarks due to small pox pustules. 2. Fracture of Bones: A paste is prepared by mixing fresh stem of this plant, Duba (<i>Cynodon dactylon</i>), Gurja (<i>Tinospora cordifolia</i>) leaves (at a ratio of 2:1) along with about 50gms of Kauni

Table 1 Continued.....

Table 1 Continued.....

			Aroid (E)			(Setaria italic) powder. The whole mixture thus obtained is used as a bandage material on the fractured part of the body. After covering with the above paste the fractured parts are tied with two or more split bamboo with stem bark of Agedi (Cissampelos Pereira), to hasten fracture. Poultice is changed daily up to 22days.
14	Scindapsus officinalis (Roxb.) Schott		Kanre Lahara(To) Gajpipul(B) Long pepper (E)	Terrestrial/ Climber	Fruit	Body ache: 5-6 fruits as collected from the jungle are cleaned with water and crushed on a black grinding stone and paste thus obtained are applied externally on the body or body parts to reduce pains & aches.
15	Asteraceae	Ageratum conyzoides L.	Ahemnangmi (To) Kukursuka/ Occhunti (B) Goatweed (E)	Terrestrial/ Herb	Leaf	Bleeding: A handful of tender leaves are collected, cleaned and squeezed between both palms and the juice thus obtained is applied directly on the wounded area of the body or body part(s) as per required quantity to stop bleeding.
16	Artemisia nilagirica (C.B. Clarke) Pamp.		Dungchu(To) Nagadana(B) Indian worm wood (E)	Terrestrial/ Shrub	Whole Plant	1. Antiseptic: Leaves are cleaned carefully and crushed on a stone and thus prepare paste is applied either directly or with few drops of honey to reduce the possibility of infection of wound. 1. Asthma: Bidi (a local cigar) is prepared from sun dried flowering heads kept in 'Tarapata' (Macaranga denticulata) leaves and smoked by adults to reduce the breathlessness in asthma and in case of children below the age of 12 a fume of the same is inhaled. 2. Joint-pain: Root are cleaned and crushed on a stone and the paste thus prepare is applied as poultice on effected joints to relieve pain.
17		Bidens pilosa L.	Agedi(To) blackjack (E)	Terrestrial/Herb	Leaf	Sores & Wounds: Tender leaves are cleaned and squeezed and juice thus obtained is applied on wounded area externally. After application avoid touching water on that wounded area.
18		Tridax procumbens L.	Botua-singdi (To) Tridakhya (B) Coatbuttons(E)	Terrestrial/ Herb	Leaf	Bleeding: A handful of tender leaves are collected, cleaned and squeezed between both palms and the juice thus obtained is applied directly on the wounded area of the body or body part(s) as per required quantity to stop bleeding and quick healing of the wound(s).
19	Bixaceae	Bixa orellana	Dutasing /Yekungshe(To) Latkan/Sindure(B) Lipstick tree(E)	Terrestrial/ Shrub	Bark & Seeds	1. Dysentery: Bark is chopped into small pieces and is boiled in a wide mouthed earthen pot until final solution become 1/3rd of primary content, the aqueous infusion thus obtained is given 3-4 times day till the motion stops and stomach-ache is cured. After recovery administered curry mixed with Singdi-peikhati (Paederia foetida) & Pendrasing (Murraya koenigii) for 2-3 days in accordance with the acuteness of the disease. 2. Animal bites or Insect stings: For any of such occasion immediately few dried seeds chopped into powdered with stone mortar or any heavy materials and thus dry powder applied around the affected areas to reduce the chance of infection.
20	Boraginaceae	Cordia dictoma Forst. F.	Daising (To) Bahanari (B) Indian Cherry (E)	Terrestrial/ Tree	Leaf & Fruit	1. Ulcers: Tender leaves 4-5 are cleaned and squeezed gently in between palm and juice thus obtained is then mixed with few drops of honey and applied immediately on the ulcer to hasten the healing. 2. Headache: Fresh mature leaves (latex bearing) 5-6 are put on fire for about 2-3 minutes then cooled for ½ minutes and then applied on the forehead till the leaves are totally cooled.

Table 1 Continued.....

Table 1 Continued.....

							Now-a-days they apply some market available oil on the forehead before the above fomentation process. 3. Fruits are edible, and consumed as vegetable.
21	Capparidaceae	Capparis zeylanica L.	Simbri (To) Kalkera/Kalkera (B) Ceylon Caper (E)	Terrestrial/ Shrub	Leaf	Gout: Leaves about 8-10 bruised on stone pestle and juice thus obtained is soaked in a cotton role and used as poultice on the joints during bedtime for 7 days to reduce the pain. It may be continued after 7days in accordance with the acuteness of the pain.	
22	Caryophyllaceae	Drymaria cordata (L.) Willd. Ex Roem. & Schult.	Makaibi (To) Avijal (B) Tropical Chickweed (E)	Terrestrial/ Herb	Leaf	1. Constipation & Indigestion: 8-10 fresh leaves are boiled and decoction thus obtained is filtered and the filtrate is given @ 1/2 cup at bedtime as to treat constipation and to prevent digestive problem. 2. Common Cold: Bidi (a local cigar) is prepared from a handful of sun dried leaves kept in 'Tarapata' (Macaranga denticulata leaves) and smoked by adults for the recovery from giddiness and in case of children below the age of 12 a fume of the same is inhaled.	
23	Combretaceae	Terminalia arjuna (Roxb. ex DC.) wt. & Arn.	Arjun (To, B, E)	Terrestrial/ Tree	Root	Menorrhagia: Parts of root is roasted on charcoal and bruises with few drops of 'Eu' (Local country liquor made from Marua i.e. Eleusine coracana) and the juice thus obtained is given twice daily with the following directives i.e. to take the juice at early morning towards facing the east and at evening towards facing the west to stop heavy or prolong menstruation bleeding.	
24	Convolvulaceae	Convolvulus arvensis L.	Changdi (To) Hiron khuri/Har-in Khura(B)Field Bindweed (E)	Terrestrial/ Herb	Root	Constipation: Roots cleaned and thoroughly crushed with stone mortar; the juice thus obtained is given approximate 1/2 cup at bedtime as purgative for the treatment of constipation.	
25		Cucurbita pepo L.	Yanasing (To) Squash (B, E)	Terrestrial/ Climber	Stem	Abdominal pain: 5 to 6 small pieces of Juicy stem is put into a brass pot and boiled for 10 minutes with a cup of water. The aqueous extract thus obtained is given @2Tsp for 2-3times in a day (must be the first dose at early morning in empty stomach) to reduce the colic pain.	
26	Cucurbitaceae	Momordica cochinchinensis (Lour.) Spreng	Ambarshi (To) Kankrol (B) Chinese Cucumber (E)	Terrestrial/ Climber	Leaf & Stem	1. Fever: Fresh leaves 8-10 are cleaned properly and decoction thus obtained is given @2Tsp with light food for 2-3times in a day for 3 days to reduce the body temperature. 2. Mouth odor: Thick part of stem is cut into small pieces and thus used as brushing on teeth for mouth refreshing and to control infection from bacteria on gums.	
27	Dilleniaceae	Dillenia pentagyna L.	Kunting (To) Bon-chalta(B) Dog Teak (E)	Terrestrial/ Tree	Fruit	1. Cooling agent: A handful of fruits are put into a brass pot with 3-4 cups of drinking water and soaked for overnight, then the infusion thus obtained is filtered and the filtrate is given approximate one cup as traditional medicine preferably at early morning in empty stomach. The remaining soaked fruits crushed on a stone and the paste thus applied externally on skin as a cooling agent for the relief of burning sensation. 1. Ripped fruits are medium crushed and used in preparation of Pickle.	
28	Euphorbiaceae	Breynia retusa (D)	Mimaising (To) Chitki (B) Cup Saucer Plant (E)	Terrestrial/ Shrub	Plant	Eye infection: Tender leaves 2 -5 pieces are crushed gently in between palms and the juice thus obtained is filtered, the filtrate is used as eye drops and applied on the edges of the eye lids to reduce the inflammation and redness of the cornea as well as irritation of the eye due to infection.	
29		Euphorbia hirta L.	Chapangsing(To) Khirika (B)	Terrestrial/	Latex &	1. Bronchitis: Whole plant is chopped into small pieces and is boiled with a glassful of drinking water in a brass pot until the final solutions reduced to 1/3rd of primary content, decoction thus	

Table 1 Continued.....

Table 1 Continued.....

		Common Spurge (E)	Herb	Plant	obtained is given @2Tsp for 3-4 times daily to clear the mucus. 2. Asthma: Leaves are chopped into small pieces and are boiled with a glassful of drinking water in a brass pot until the final solution become 1/3rd of its primary content. A cup full of this aqueous extract is mixed with a few drops of honey and taken like Chai (tea) twice daily to get relief of breathlessness. 3. Boils & Blisters: By squeezing the plant (excluding root portion) gently between two palms, the latex is comes out, the juice thus obtained is applied directly over the boils for early suppuration.
30	Golehidion sphaerogynum Kurz.	Jambaising (To)	Terrestrial/Tree	Bark	Stomach disorder: Bark about 10gms chopped into small pieces and put it into drinking water at about 1:6 ratio for soaking overnight, the infusion thus obtained is then filtered and the filtrate is given ½ cup as medicine preferably at early morning in empty stomach for 1 or 2 days.
31	Jatropha curcus L.	Sada or Sweet Verenda (B) Physic Nut (E)	Terrestrial/ Shrub	Stem	Toothache: Stems are cut into pieces & use as tooth sticks and or brushes at morning and or while feeling severe pain. Usually Totos collect this stick regular basis while collecting their firewood in the jungle.
32	Kirganelia reticulata (Poir.) Baill.	Dirsai (To) Bhuinamla (B) Black-honey Shrub (E)	Terrestrial/ Shrub	Leaf	1. Bleeding gum: 8-10 tender leaves are squeezed in between palms, juices thus obtain is soaked with a fresh cotton ball and applied directly on affected gums to stop bleeding and healing quickly. After 15-20 minutes wash mouth with cold water. The process may continue for 2-3day at early morning. 2. Toothache: Same Juice soaked with a fresh cotton ball and is to apply directly inside the ear carefully so that it should not go much deep in the ear-passage to reduce toothache.
33	Phyllanthus emblica L.	Maishe (To) Amla (B) Indian gooseberry (E)	Terrestrial/ Tree	Shoot	Toothache: Tender shoots are cut into small pieces and then one piece is tied with a thread and placed on the side of the ear externally considering the same side of the affected teeth. The whole process is done in the early morning before sunrise. It is observed that as the stem dried up the pain reduces gradually.
34	Ricinus communis L.	Reri (To) Eranda/Reri (B) Castor oil plant (E)	Terrestrial/ Shrub	Beans	1. Vermifuge: Collected beans are crushed in an iron mortar, then press & squeeze and obtain oil drops, which is further filtered through a bamboo sieve and the filtrate 1-2 drops of oil is given to the small child at morning in empty stomach to expel the intestinal worms. 2. Constipation: About 1Tspfull oil is given by weekly to an adult after dinner for the treatment of constipation.
35	Flacourtiaceae	Gotasing (To) Chaulmugra (B) Chhal Mogra (E)	Terrestrial/ Tree	Seed & Fruit	1. Skin Diseases (Scabies): A handful of Seeds in whole are boiled in mustard oil for 20-30 minutes, then cooled and filtered; filtrate thus obtained is used as medicated massage oil and apply externally on affected areas to cure. 2. Pulp of fruits are eaten after boiling in water by the local people.
36	Fabaceae	Bichi (To) Biswal (B) Rusty mimosa (E)	Terrestrial/ Climber	Bark, Fruits & Stem	1. Anti-dandruff: Bark about 10gms chipped into small pieces and put into lukewarm water at about 1:6 ratio for soaking overnight, then filtered and the filtrate infusion thus obtained is applied on scalp as medicine preferably before bath to avoid dandruff. 2. Antidote to Snake bite: Tender barks are chipped & crushed with a stone mortar and add little amount of Eu (locally available homemade country liquor made from Marua i.e. Eleusine coracana); the mixture then filtered and the filtrate thus obtained is applied immediately on biting area as anti-venom to give relief from pain and the burning sensation from snake poison. 3. Fruits

Table 1 Continued.....

Table 1 Continued.....

						& Stem together are mixed, crushed and the mixture is spread on the water bodies as fish stupifier.
37	Butea monosperma (Lam.)	Palash (To, B) Flame of the Forest (E)	Terrestrial/ Tree	Leaf		Vermifuge: Fresh leaves 8-10 are boiled with glassful of drinking water in a brass pot until the solution finally reduced to ½ of the primary content; decoction thus obtained is given @1Tsp by weekly to the small children while empty stomach in the morning to expel the intestine worms.
38	Cassia alata L.	Lutodabai (To) Daadmordon (B) Candle Bush (E)	Terrestrial/ Shrub	Leaf & Fruits		Skin diseases (Ringworm): Leaves and fruits approximately in equal amount are crushed together on a stone pestle and the paste thus prepare is applied on infected areas preferably at bedtime. Next day morning that part of the body is washed with cold water. It is continued till cure.
39	Tamarindus indica L.	Tetla (To) Tetul (B) Tamarind (E)	Terrestrial/ Tree	Bark		1. Jaundice: Bark about 10gms chipped into small pieces and put into lukewarm water at about 1:6 ratio for soaking overnight, next day morning the infusion thus obtained is filtered and the filtrate @½ cup is given as medicine immediately and rest of the infusion is kept in a brass pot and given @ ½ cup at bedtime. This process is repeated up to 3days in accordance of the acuteness of the diseases. 2. Sore on Leg: Bark about 10gms or a bit more is crushed on a black stone and paste thus prepared is applied externally to infected areas preferably at bedtime to get relief from pain, it also helps to hasten the healing process.
40	Lamiaceae	Ocimum sanctum L.	Terrestrial/ Shrub	Leaf		1. Bronchitis: i) Hand full of fresh leaves are cleaned properly and crushed along with 2-4 Pipelee (Piper mulesua) and extract thus obtained is given @1Tsp for 3-4 times in a day to reduce mucus. ii) In case of acuteness, thus the mixture boiled with 1cup of water till the entire volume reduces to approx. half of its primary volume and then it filtered and filtrate decoction thus obtained is given like Chai (Tea) for 2-3 times in a day. 2. Constipation: Fresh leaf is boiled in approximately 2cups of water and the decoction about 1cup thus obtained is given at early morning in empty stomach to cure constipation.
41	Meliaceae	Azadirachta indica A. Juss.	Terrestrial/ Tree	Leaf		1. Skin disease (contact dermatitis): A hand full of fresh leaves is boiled in approximately 1Ltr of water and the decoction thus obtained is applied externally with a fresh cotton ball on the effected skins. In case of acuteness of the disease, the remaining aqueous extract is kept in a hollow bamboo-jar and later used during bath. Or after boiling the leaves in water, kept it till it be cooled and the whole materials are squeezed with hands and the paste thus obtained is applied externally as poultice on the effected skins. 2. Jaundice: Tender leaves a hand full of is cleaned and boiled with water 1:6 ratio at night till the final solution comes to 1/3rd of primary content and kept it in a brass pot to soaked overnight. In the morning the decoction thus obtained is filtered and the filtrate is given @ 2tsp for the treatment of liver (preferably the 1st dose starts at early morning in empty stomach and again at evening before dinner) initially for 3days, but may be continued more in accordance with the acuteness to the condition of the patient.
42	Menispermaceae	Tinospora cordifolia(Thunb.) Miers	Terrestrial/ Climber	Leaf		Vermifuge: Fresh leaves 8-10 are boiled in water approximately 1:4 ratio in a brass bowl and the final solution become 1/2 of the primary content; the decoction thus obtained is given @1Tsp full once or twice in a week in empty stomach to children age group of 03-12 years as vermifuge.
43		Cissampelos	Terrestrial/ Tree	Leaf		1. Body swelling: Approximately 15-20 leaves are chipped into small pieces and crushed with a

Table 1 Continued.....

Table 1 Continued.....

		pereira L.	Kjiri (B) Velvet leaf (E)	trial/ Tree	& Bark	stone pestle and fresh juice thus obtained is applied externally on abdomen and back preferably at daytime to reduce the internal burning sensation. After a while wash their body with cold water. 2. Fibers: The bark is strong and so used for tying purposes.
44	Mimosaceae	Mimosa pudica L.	Garchang (To) Lajjabati (B) Sensitive Plant/Touch-me-not Plant (E)	Terrestrial/ Climber	Leaf & Stem	Intermittent fever: Both fresh leaves and tender stem approximately in equal amount of ratio are crushed together on a stone mortar and the extract thus obtain is given @ 1Tsp along with 1Tsp full honey thrice daily to control tertian temperature.
45	Moringaceae	Moringa oleifera Lam.	Sajna-munto (To) Sanja (B) Drumstick Tree (E)	Terrestrial/ Tree	Leaf	1. Blood-Pressure: A handful of fresh leaves are cleaned and crushed on a stone mortar and juice thus obtained is given once in a week @ one small bowl to control high pressure. 2. Leucorrhea: A handful of fresh leaves are boiled in 4 cups of water after sunset till the water comes half of its original content and keeps in an earthen pot over night to cool; decoction thus obtained is filtered and the filtrate is given @ ½ cup twice in a day (1st dose is given immediately after sunset and 2nd one is just before the sunrise) in empty stomach to stop white vaginal discharge.
46	Myrtaceae	Syzygium cumini (L.) Skeels	Khudijam (To, B) Java Plum (E)	Terrestrial/ Tree	Seed	Indigestion: Seeds are collected and dried up and crushed in a stone mortar, thus the powder is given with water preferably from Hauri river to cure winds.
47	Nyctaginaceae	Boerhavia diffusa L.	Lanchkicha (To) Punornova (B) Red hogweed (E)	Terrestrial/ Herb	Root	1. Jaundice: Part of roots is clean properly and boiled in a wide mouthed earthen pot till the final solution reduced to 1/3rd of its primary content; aqueous extract thus obtained is given @ 2sp full with little amount of Gur (Jaggery) after taking light food for 2-3 times in a day to reduce the yellowness of the body. 2. Stomach disorder: About 1Tsp full of above extract is also used in any kind of gastric problems & indigestions with little drinking water.
48	Piperaceae	Piper longum L.	Pipla (To) Pipul (B) Indian long pepper (E)	Terrestrial/ Climber	Seeds	1. Cough & Cold: Dried seeds 5-6 crushed and boiled in 1 cup of water, extract thus obtained is taken as Chai (Tea) @2-3 times daily till get relief from cough. 2. Toothache: Dried seeds 2-4 put in an earthen pot containing a cup of water, it soaked overnight and decoction thus obtained are applied with a small cotton ball internally on the particular infected teeth to reduce pain and sensitivity.
49		Piper mullesua D. Don.	Piplee (To) Bonpipul (B) Hill Pepper (E)	Terrestrial/ Climber	Seed & Leaf	1. Cough & Cold: Bidi (a local cigar) is prepared from sun dried seeds 3-4 kept in 'Tarapata' (Macaranga denticulata leaves) and smoked by adults to get relief in dry cough and cold and in case of children below the age of 12 a fume of the same is inhaled for 2-3times accordingly. 2. Skin disease (Rash): A handful of leaves are boiled @1:10 ratio of water in an earthen pot at early morning; the extract thus obtained is mixed with normal water to take bath.
50	Poaceae	Cynodon dactylon (L.) Pers.	Duba (To) Durba (B) Bermuda	Terrestrial/ Herb	Plant	1. Eye-irritation: Fresh leaves a handful of are cleaned properly and bruised with stone mortar and squeezed, juice thus obtained is filtered and the filtrate is applied surrounding of eyes externally to get rid of itching sensation. 3. Bleeding: Similarly a handful of leaves are cleaned

Table 1 Continued.....

Table 1 Continued.....

			grass (E)				properly and bruised with any available stone mortar and paste juice thus obtains is applied immediately on minor wound as haemostatic agents. This method is widely practiced while hunting & gathering at jungle.
51	Polygonaceae	Fagopyrum esculentum M.	Lappasak (To) Buckwheat (E)	Terrestrial/Herb	Whole plant	1. Blood-Pressure: Whole plant is cleaned properly and bruised with a stone mortar and squeezed; juice thus obtain is filtered and the filtrate is given @ 1cup or one small bowl once or twice in a week to control high blood pressure. 2. Whole plant is boiled and considered as a vegetable dish.	
52		Polygonum Chinense Linn.	Tamandi (To) Biskatali (B) Chinese Knotweed (E)	Terrestrial/Herb	Leaf	1. Bleeding gums: Leaves are cleaned properly and crushed with a stone mortar and squeezed, juice thus obtained is filtered and the filtrate is given @ 1cup or bowl full to children as tonic to protect from bleeding gums. 2. Fresh leaves are boiled & taken as vegetable.	
53		Polygonum nepalense Meissn.	Birsai (To) Panmorich (B) Nepalese smartweed (E)	Terrestrial/Herb	Leaf	1. Sprain: Tender leaves 5-6 are crushed with stone mortar and extract thus obtained is applied as poultice on swelled parts of the body to reduce the pain of the sprain. In case of ankle or knee joints injury due to fall from tree etc., the same leaf paste is taken in between two warm leaves of 'Harsoo' (Pothos Scandens) and bind with a cotton role on the injured place before bedtime to reduce the swelling and pain. 3. Plant as a whole boiled & taken as vegetable.	
54	Portulacaceae	Portulaca oleracea Linn.	Chapangsing (To) Boro nuniya (B) Purslane (E)	Terrestrial/Herb	Whole plant	2. Cooling agent: Whole plant is cleaned properly and crushed with a stone mortar and squeezed, juice thus obtained is filtered and the filtrate is applied externally on the skin having burning sensation. 2. After boiling the whole plant is used as vegetable.	
55	Rubiaceae	Paedaria foetida L.	Singdi-peikhati (To) Gandal pata (B) Skunk Vine (E)	Terrestrial/Climber	Leaf & Shoot	1. Indigestion: Fresh leaves 8-10 are cleaned properly and crushed with a stone mortar and extract thus obtained is given @ 1Tsp with @ 1Tsp decoction of Eueng (seeds of Zanthoxylum armatum) as digestive. 2. Piles & Fistula: Tender shoots containing 10 – 12 leaves are chipped into small pieces and boiled in 2 cups of water in a brass pot and to reduce the quantity of the water to about 1/4th of the original volume, decoction thus obtained is given at bedtime to reduce pain and burning sensation.	
56	Rutaceae	Murraya koenigii (L.) Spreng.	Pendrasing (To) Curry-pata (B) Curry/leaf (E)	Terrestrial/Shrub	Root, Stem bark & Leaf	1. Body ache: Part of root is cleaned properly and bruise with a stone and extract thus obtained is given @ 1-2Tbs with few drops of Honey or Gur (Jaggery) once or twice in a day to reduce the pain. 2. Diarrhea: Stem bark is chipped into small pieces and crushed on a black stone, the extract thus obtained is given @ 1 or 2Tsp with ½ cup of water for 3-4 times in a day to control the motions. 3. Leaves are used in cooking for Flavouring curries, especially with small fishes.	
57	Scrophulariaceae	Zanthoxylum armatum DC.	Eueng or Jousing-shosa (To) Timbur (B) Winged Pricely Ash (E)	Terrestrial/Shrub	Spines, Leaf & Seeds	1. Skin Diseases (Allergic itchy rashes): 10-12 spines of the plant are removed from the stem with a forceps type of tool and are grinded vigorously on a stone platform till the latex transformed into smooth paste like sandalwood paste, then the paste is applied externally on the affected areas preferably at bedtime. N.B.: Totos use to take various kinds of insects including spiders in their regular food habit. Due to this kind of food habits they are affected severe allergies on their body and skin from spider's toxic saliva etc. This traditional medicine is preferably used on such cases. 2. Indigestion: Seeds approx 10gms are cleaned properly and soaked overnight in one cup	

Table 1 Continued.....

Table 1 Continued.....

58	Scoparia dulcis L.	Chini-jhar (To) Sagar chini/ Bon Dhone (B) Licorice weed (E)	Terrestrial/ Herb	Seed & Leaf	<p>of water in an earthen pot; decoction thus obtained is given after meal to reduce acidity.</p> <p>3. Pickle: Tender leaves are cleaned and grind thoroughly on a stone tiles, paste thus obtained is served raw after adding a pinch of salt with rice-meal as pickle. It is said that it may increase the digestive capacity.</p> <p>1. Mouth-ulcer: Dried seeds 2-5gms are soaked in a cup of water in a brass pot overnight and decoction thus obtained is used to gargle twice/thrice in a day or two. For acuteness of the condition, more concentrated decoction is applied with a small cotton ball internally on the particular area to reduce redness and burning sensation. 3. Warts: Tender leaves 5-6 crushed on black stone with a few drops of water and paste thus obtained is applied externally as poultice on warts head. The warts are detached from the skin after 1-2days as paste become dried and are removed automatically.</p>
59	Solanum nigrum L.	Gunderiase (To) Kakmachi (B) Black Nightshade (E)	Terrestrial/ Herb	Leaf & Fruit	<p>Cough & Cold: i) Fresh leaves 8-10 are cleaned properly and crushed along with 2-4 Piplee (Piper mulliesua) and extract thus obtained is given @ 1tsp for 3-4 times in a day to reduce mucus. ii) Fruits about 10gms are cleaned and squeezed in between palms, extract thus obtained is given @ 1Tsp along with 1Tsp honey and ½ tsp paste of Bon-ada (Rhizomes of Kaempferia rotunda) for 2-3 times in a day along with Chai (Tea) to reduce cough.</p>
60	Capsicum frutescens L.	Gojamuri (To) Naga-morich (B) Bird Pepper (E)	Terrestrial/ Shrub	Fruit	<p>1. Vegetables: Fruits either in a whole or part of is chipped into small pieces are used in daily food separately along with a pinch of salt and or pickle. 2. Beverage: Fruits 8-10 chipped and or half-crushed and are used as one of the ingredients for the preparation of locally available homemade alcoholic drink made from Marua (Eleusine coracana) known as Eu.</p>
61	Sterculiaceae	Myrcing (To) Ulatkambol (B) Devil's cotton (E)	Terrestrial/ Shrub	Leaf	<p>Constipation and Indigestion: Leaves 5-6 are cleaned properly and crushed on a stone pestle and squeezed; extract thus obtained is given @ 2Tsp once after sunset to clear bowl syndrome.</p>
62	Urticaceae	Pagra (To) Bichuti (B) Stinging Tree (E)	Terrestrial/ Shrub	Root	<p>1. Prolonged fever: Part of root is cut approximately 2-3inches, then grinded well with a stone mortar and squeezed; juices thus obtained is given @ 1tsp with equal amount of Gur (Jaggery) twice daily preferably in empty stomach to get relief from prolonged fever.</p> <p>2. Fiber from bark is used for making cordage.</p>
63	Verbenaceae	Gising (To) Bommola (B) Beautyberry Plant (E)	Terrestrial/ Tree	Bark	<p>Pneumonia: Bark or part of bark is bruised on stone with few drops of water and squeezed; extract thus obtain is given @ 1tsp with equal amount of honey for 3days to the patient suffering from pneumonia.</p>
64	Cledendrum infortunatum L.	Bhatpatta (To) Ghentu (B) Hill glory bower (E)	Terrestrial/ Shrub	Root & Leaf	<p>1. Diarrhoea: Fresh root bark about 1Tbs soaked in water and infusion thus obtain is given with a pinch of table salt and sugar molasses to cure the disease. 2. Skin disease (Eczema): Fresh leaves about a handful of are crushed on a grinding stone and paste thus obtained is directly applied on the affected body part(s) and wait till it dried up. 3. Fever (Malaria): A handful of Fresh leaves are crushed on a grinding stone and extract thus obtained are filtered, and the filtrate is given</p>

Table 1 Continued.....

Table 1 Continued.....

65	Premna barbata Wall. ex Schauer	Damroo (To) Bearded Premna (E)	Terres- trial/ Climber	Bark & Fruit	twice a day with a little honey to cure malarial fever. The drug is continued till recovery. N.B.: During the time of world war II, the soldiers who were posted at North Bengal area suffered due to epidemic of severe malarial fever and everyday huge numbers were lost their life; however, it was found that those who used Bhatpatta in their day to day life they survived. Totos learned this and since then they use this as a medicinal plants for the disease. Throat-sore: Bark or part of bark and the ripened fruits are mixed together approximately in equal ratio and grind on a stone platform then squeezed; extract thus obtain is then mixed in a cup of lukewarm water for gargle to relief from tonsil and throat-pain.
66	Vitex negundo Wall. ex Schauer	Sewali (To) Nishinda (B) Chaste tree (E)	Terres- trial/ Shrub	Leaf	Headache: Bidi (a local cigar) is prepared from sun dried leaves 2-3 kept in 'Tarapata' (Macaranga denticulata leaves) and smoked by adults to get relief from giddiness and in case of pregnant woman a fume of the same is inhaled for 2-3times accordingly. 1. Vomiting: Fresh fruits 1 or 2 are collected, cleaned and thus given raw with little salt to stop vomiting. 2. Whole plant is used locally as fodder to cattle.
67	Zing- ibera ceae	Alpinia malaccensis (Burm.) Rosc. Ginger (E)	Terres- trial/ Herb	Fruit	Fracture of Bones: A paste is prepared by mixing fresh rhizomes as required (depends upon injury) of this plant, approximately 50gms of Kauni (Setaria italic) powder with few drops of Eu (Locally available homemade country liquor made from Marua i.e. Eleusine coracana) along with bruised Timbur (bark latex of Zanthoxylum armatum) as a binding agents. The whole mixture thus obtained is used as a bandage material on the fractured part of the body. After covering with the above paste the fractured parts are tied with support of two or more split bamboo clum stem or stem bark of Agedi (Cissampelos Pereira), to hasten healing of fracture. Poulitce is changed daily up to 21-22days. As stated the rhizome is worked as cooling agent to get relief of sprains.
68	Kaempferia rotunda L.	Bhui-Champa/ Bon-ada (B) Indian Crocus (E)	Terres- trial/ Herb	Rhi- zome	

the following order – name of the family – scientific name of the plant – vernacular name – parts use – prescription.

Observation:

Results and Discussion

After critical scrutiny of the information given in the table 1, it is observed that 68 plant species belonging to 65 genera under 39 families of Angiosperms are used by 123 different ways by the Toto populace of the state. Among these 104 usages under traditional medicinal prescription are categories into 34 groups. A statistical analysis of the usages of the plants by the Toto tribe is given in the table 2, Fig. 1, below.

From the table 2 is observed that Gastric disorders and Skin Diseases are the most common ailments among the Toto tribe, followed by Cough & Cold, Constipation, Sores-Wounds & Ulcers and Fever.

It is very interesting to note that, among different plant parts leaf and the tender shoots are used in most of the cases (39 prescriptions). A conspectus of the usages of the different plant parts are given in the table 3, Fig. 2.

Conclusion

Toto tribe is the one and the only endemic endogamous tribe of the state. But at present with the pace of civilization this endemic tribe of the state is continuously face the westernization and as result a huge acculturation in their daily behavioral life takes place. At present most of the Toto people give up their traditional dress and start to wear western dress and blindly follow the western culture to fulfill every needs of their life, they also give up their age old traditional medicinal practices which are entirely based on the natural resources. Instead of that they are now mostly depends on the western medicine to treat their ailments. The Toto medicine and their medicinal practice is a vast

(To – Toto; B – Bengali; E – English)

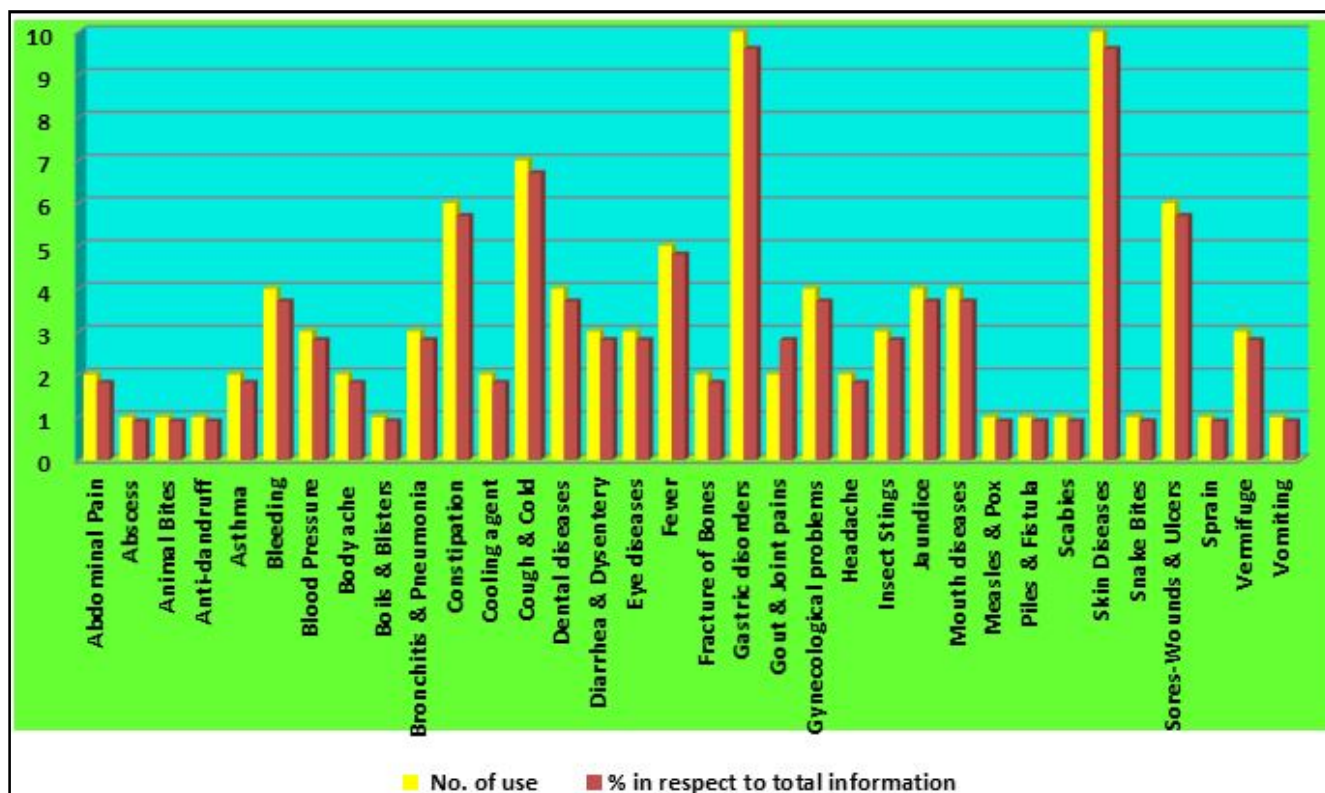


Fig. 1: Numerical Analysis of the TOTO Prescription.

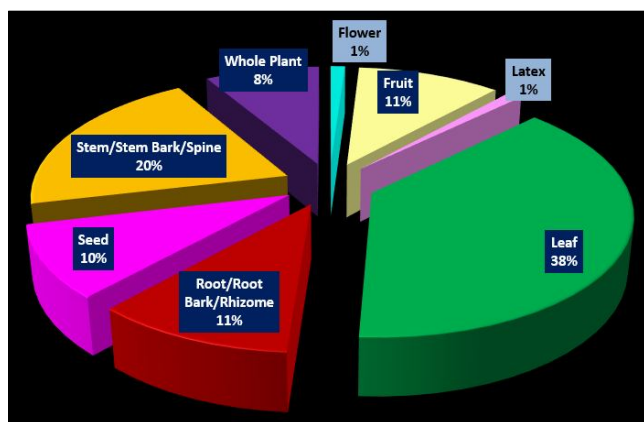


Fig. 2: Statistical analysis of different plant parts use.

science and this science has no written documentation a group of people who are designated as “*Pao*” (medicine man or woman) maintain this medicinal knowledge completely based on their regular practice and by ancestral inheritance system. These vast knowledge will be vanish entirely with the death of these people as the present younger generation of the Toto society are not bother at all about their culture and medicinal practice. So, to document this vast knowledge system this type of field exploration is one and the only functional tools which adopted here. The present survey reveals that Toto tribe is ethno-botanically very sound as they able to treat various types of ailments (39 in numbers) and the list includes simple and minor ailments like gastric disorder

to a complex diseases like ophthalmic problem and cardiac diseases. So, it is hope that, though this study is not a complete study in every respect many lacuna is their which are not reached here due to shortage of time, human resources, funding, etc. various barrier which author have to face. But it is a small leap towards the traditional medicinal study among the Toto tribe and I am sure that this makes enthusiastic to many young researchers to complete the work of Toto tribe.

Acknowledgement

A special word of thanks to DR. Sunit Mitra, Asso. Prof. & Head of the Dept. (Botany) Ranaghat College, Nadia, West Bengal for the patience he has shown to undertake the analytical part of this study and also wish to express indebtedness to all the members and families of the *Toto* tribes of the studied area for their cooperation, valuable support to carry out this research.

References

Chatterjee, M. (2013). Jalpaiguri zillar veshaj sampod porichiti: prosongo byaboharik dik. Kiratbhumi, jalpaiguri zilla sankalan 2nd part. Pp.276.

Haldar, B. (2013). Jalpaiguri zillar swastha o chikitsha byabostha. Kiratbhumi, jalpaiguri zilla sankalan 2nd part. Pp.299.

Jain, S.K. and R.R. Rao (1977). A handbook of Field & Herbarium methods. Today & Tomorrow’s Printer Publisher, New

Table 2: Conspectus of the usages of the plants species by the Toto tribe.

Sl. No.	Use	No. of use	% in respect to total information
1	Abdominal Pain	2	1.80
2	Abscess	1	0.90
3	Animal Bites	1	0.90
4	Anti-dandruff	1	0.90
5	Asthma	2	1.80
6	Bleeding	4	3.70
7	Blood Pressure	3	2.80
8	Body ache	2	1.80
9	Boils & Blisters	1	0.90
10	Bronchitis & Pneumonia	3	2.80
11	Constipation	6	5.70
12	Cooling agent	2	1.80
13	Cough & Cold	7	6.70
14	Dental diseases	4	3.70
15	Diarrhea & Dysentery	3	2.80
16	Eye diseases	3	2.80
17	Fever	5	4.80
18	Fracture of Bones	2	1.80
19	Gastric disorders	10	9.60
20	Gout & Joint pains	2	2.80
21	Gynecological problems	4	3.70
22	Headache	2	1.80
23	Insect Stings	3	2.80
24	Jaundice	4	3.70
25	Mouth diseases	4	3.70
26	Measles & Pox	1	0.90
27	Piles & Fistula	1	0.90
28	Scabies	1	0.90
29	Skin Diseases	10	9.60
30	Snake Bites	1	0.90
31	Sores-Wounds & Ulcers	6	5.70
32	Sprain	1	0.90
33	Vermifuge	3	2.80
34	Vomiting	1	0.90
	TOTAL	104	

Table 3: Conspectus of the usages of the plant parts.

Sl. No.	Plant parts	No. of use	% Value
1	Flower	1	1.10
2	Fruit	10	10.60
3	Latex	1	1.10
4	Leaf	36	38.30
5	Root/Root Bark/Rhizome	10	10.60
6	Seed	9	9.60
7	Stem/Stem Bark/Spine	19	20.20
8	Whole Plant	8	8.50

Delhi, India.

Jain, S.K. and V. Mudgal (1999). A hand book of Ethnobotany. M/s Bishen Singh Mahendra Pal Singh.

Majumdar, B. (1993). Cultural and Economic Transformation of a Small Tribe in the Sub-Himalayas- A Study of the Totos, unpublished Ph.D. Dissertation, University of North Bengal.

Majumdar, B. (1995). Poschimbonger khudrotama janagosthi: Toto. Uttarbongo prosongo. Pp.15. *Bengal studies series, 1:*

Majumdar, B. (1998). The Totos: cultural and economic transformation of small tribe in the sub Himalayan Bengal: Academic Enterprise.

Majumdar, B. (2010). Toto upojatir sanskritik poriprekshit, byadhi o chikitsa. An anthology on educational & cultural aspects with inhabitants of North Bengal; lokayat angina uttarbanga, Pp.48-59.

Majumdar, B. (2013). Jalpaiguri zillar lokochikitsa o lokoveshaj. Kiratbhumi, jalpaiguri zilla sankalan 2nd part. Pp. 290.

Mitra, A K. (1951). District Census Handbook. Jalpaiguri. Appendix VII & VIII. Directorate of Census Corporation. West Bengal.

Mudgal, V., D.C. Pal, R.N. Kayal and S. Saha (1999). Ethnobotany Of Totopara, M/s Bishen Singh Mahendra Pal Singh.

Nandi, R. (2013). Jalpaiguri jelar bonoushadhi. Kiratbhumi, Jalpaiguri zilla sankalan 2nd part. Pp.263.

Sanyal, C. (1973). The Meches & The Totos two sub-himalayan tribes of North-Bengal. University of North Bengal, *North Bengal studies series, 1:*

Sarkar A.K., M. Dey and M. Mazumder (2017). A Comparative Study of Tree Species Composition of Panjhora Forest Beat and Sipchu Forest Beat of Chalsa Forest Range, West Bengal, India. *J. App. Biol. Biotech., 5(2):* 45-52.

Sikdar, J.K. (1981). New plants records for West Bengal from Jalpaiguri district, *J. Bombay Nat. Hist. Soc, 78:* 103-106.

Sikdar, J.K. and D.N. Samanta (1983). Herbaceous Flora (excluding Cyperaceae, Poaceae and Pteridophytes) of Jalpaiguri district, West Bengal - A cheek list, *J. Econ. Tax. Bot., 4(2):* 525-538.

Sikdar, J.K. (1984). Contribution to the flora of Baikunthapur forest Division Jalpaiguri district (West Bengal), *J. Econ. Tax. Bot., 5(3):* 505-532.

Sikdar, J.K. and R.S. Rao (1984). Further contribution to the flora of Buxa forest division Jalpaiguri district (West Bengal), *J. Bombay Nat. Hist. Soc, 81:* 123-148.

Toto, Dhaniram (2012). Toto janjatir samah jiban sanskriti, Duarser bone-badare: Uttarbongo prosongo. Pp.73.

Webliography:

www.alipurduar.gov.in

www.bdomadarihatbirpara.org

www.censusindia.gov.in

www.census2011.gov.in

www.d-maps.com/carte.php?num_car=31184&lang=en

www.indikosh.com/dist/jalpaiguri

www.jalpaiguri.gov.in

www.latitude.to/articles-by-country/in/india/163612/totopara

www.wbdma.gov.in

www.wbprd.gov.in